CONNING MOTOR HUB SURFACE TO COMPENSATE DISK CONNING ANGLE FOR BALANCED HEAD FLYING HEIGHT ON BOTH SIDES OF A DISK IN MIRROR ABS HARD DISK DRIVES.

FIELD OF INVENTION

The present invention relates to a structure and method of mounting disks on a disk drive spindle to reduce disk conning distortion.

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DESCRIPTION OF RELATED ART

One of the primary goals of ABS (air bearing surface) design on a head slider in hard disk drive applications is to maintain a constant flying height along the actuator stroke path between inward and outward data zones on a flat disk surface. The disks on a drive spindle are typically mounted between circular spacers, or rings that apply compressive force around the inner periphery of opposite sides of the central disk portion. The compression or clamping force is chosen to keep the disk from slipping under the severe operating and environment conditions, such as high start and stop torque, high rotation speed, thermal cycling, thermal expansion, and physical shock and vibration. The clamping force typically required to prevent disk slippage under such severe environments frequently cause mounted disks to deform from an initially flat plane into non-planar shapes that compromise performance.

Over it is known that even when disks are nominally flat (planar) when received from a disk manufacturer, variations in manufacturing processes produce disks that have variations in the radial morphology (shape) around the central interior. In the past, the specifications for disks did not address the issue of disk morphology in a way that would guarantee uniform and consistent planarity (flatness) behavior when mounted on a disk spindle. Some disk manufacturers supplied disks with excessive rounding (roll-off) or bumping (ski-jump) at the inner diameter of the disk that would result in unacceptable disk distortion when mounted and clamped onto a disk spindle. Disks with such initial radial morphology variations frequently exhibited undesirable